

# IDAHO FISH & GAME DEPARTMENT

Joseph C. Greenley, Director LAKE AND RESERVOIR INVESTIGATIONS

Job Completion Report Project F-53-R-7



Job No. I-a Survival and Growth of Resident and Stocked  
Cutthroat Trout in Priest and Upper Priest  
Lakes (Survey)

Period Covered: March 1, 1971 to February 29, 1972 by

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JOB COMPLETION REPORT  
Research Project Segment

State of	<u>Idaho</u>	Name:	<u>LAKE AND RESERVOIR INVESTIGATIONS</u>
Project No.	<u>F-53-R-7</u>	Title:	<u>Survival and Growth of Resident</u> <u>and Stocked Cutthroat Trout in</u> <u>Priest and Upper Priest Lakes</u> <u>(Survey)</u>
Job No.	<u>I-a</u>		

Period Covered: March 1, 1971 to February 29, 1972

**ABSTRACT:**

The Hunt Creek trap catch of only three cutthroat trout spawners again indicates that survival of eyed eggs to catchable-size fish is minimal.

On April 28 and 29, Fisheries personnel assisted by the U. S. Forest Service and the Priest Lake Sportsmen's Association planted 26,650 catchable-sized cutthroat trout in Upper Priest Lake. Hatchery personnel marked all fish with a left-ventral fin clip. In 1971, anglers caught only 21 of this release and three fish from the 1970 catchable release. Only 91 of 43, 105 catchables released, or one out of every 474 fish planted in 1970 and 1971 entered the sportsmen's creel in two years at Upper Priest Lake.

An estimated 1,541 anglers fished 4,691 hours in Upper Priest Lake to catch 629 cutthroat, 580 kokanee, and 243 Dolly Varden between May 1 and September 3, 1971. Cutthroat trout comprised 43 percent of the total estimated catch; kokanee, 40 percent; and Dolly Varden, 17 percent.

Between June 6 and August 27, Fisheries personnel sampled with hook-and-line 15 streams tributary to Priest and Upper Priest Lake. We found cutthroat trout the dominant fish species in nearly all the tributaries. No marked cutthroat had migrated into the spawning tributaries. We found significant numbers of lake cutthroat spawners only in Upper Priest River.

Aging of cutthroat scales revealed that 89 of 175 cutthroat from all tributaries were in their third and fourth summers of life at capture. They ranged in size between 3 and 10 inches.

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## **RECOMMENDATIONS:**

Terminate operations at the Hunt Creek fish trap.

Terminate further releases of catchables in Upper Priest Lake.

Consider the opening of Indian, Kalispell, Lion, Two-Mouth and Trapper creeks in August.

Maintain the closure of Upper Priest River and its tributaries.

## **OBJECTIVES:**

To measure the relative contribution of channel-reared fry and hatchery-reared cutthroat trout to the sport take in Upper Priest Lake.

To determine movement of marked cutthroat trout planted as fingerlings and catchables into tributaries.

To measure the suitability and use of cutthroat spawning tributaries.

## **TECHNIQUES USED:**

### Hunt Creek Trap

We did not plant cutthroat eggs in the Hunt Creek incubation channel in 1971. A biological aide maintained the adult fish trap between May 4 and June 7 to enumerate cutthroat spawners returning to Hunt Creek.

### Catchable Trout Release

On April 28 and 29, Fisheries personnel assisted by the U. S. Forest Service and the Priest Lake Sportsmen's Association planted 26,650 catchable-sized cutthroat trout in Upper Priest Lake. Hatchery helpers had marked all fish with a left-ventral fin clip. The planted fish ranged in length between 4.5 and 10 inches with an average length of 7.7 inches and an average weight of 6.5 fish to the pound.

### Upper Priest Lake Creel Census

Biological aides conducted a check station creel census on Upper Priest Lake between May 1 and September 3, 1971. I divided the 126-day census season into 9 two-week intervals to provide seasonal catch comparisons. The aides operated the check station every weekend day and on four randomly selected weekdays in each two-week interval. I projected the census data collected on weekdays into total catch estimates.

### Tributary Streams Survey

Between June 6 and August 27, the aides and I sampled with hook-and-line 15 streams tributary to the lakes. I established 15 hours of angling effort as the minimum per tributary.

We examined for fin clips all captured cutthroat trout and collected scales. In addition, I noted the extent of spawning habitat, migration blocks, and use by Dolly Varden and lake cutthroat trout.

## **FINDINGS:**

### **Hunt Creek Spawner Returns**

In 1971, between May 4 and June 7 we captured only three cutthroat trout spawners averaging 14 inches in length at the Hunt Creek trap (Table 1). Minimum and maximum stream temperatures averaged 40 and 45 degrees Fahrenheit, respectively. The aide did not remove any weir pickets throughout the 35-day operation. The water was turbid in Hunt Creek between May 23 and 28.

### **Catchable Trout Release**

We released 26,650 catchable-size cutthroat in Upper Priest Lake on April 28 and 29. We made three barge trips and hauled 4,100 pounds. We planted the fish in *sheltered coves* along *the* east and west shorelines, midway up the lake, away from the influence of the Thorofare out.

During the check station census aides observed 17 marked cutthroat in the creel or anglers caught an estimated 21 marked cutthroat during the entire census season. They also caught three marked cutthroat from the 1970 catchable release (Table 2).

Only 91 of 43,105 marked catchables or one out of every 474 planted have entered the sportsmen's creels in two years at Upper Priest Lake.

## **Minimum Estimated Effort and Catch**

### **Combined Sport Harvest**

We censused 61 days of a possible 72 days. During the census, the aides missed two scheduled days due to other priorities (Table 3). Census personnel interviewed 55 percent of the estimated anglers.

Between May 1 and September 3, census personnel interviewed 849 anglers who fished 2,557 hours to catch 354 cutthroat, 399 kokanee and 131 Dolly Varden from Upper Priest Lake (Table 4).

An estimated 1,541 anglers fished 4,691 hours to catch 629 cut-throat, 580 kokanee, and 243 Dolly Varden. Cutthroat trout comprised 43 percent of the total estimated catch; kokanee, 40 percent; and Dolly Varden, 17 percent (Table 5).

### **Resident Sport Harvest**

Resident sport anglers comprised 22 percent (342) of the estimated anglers and harvested 28 percent (407) of the total estimated catch and 26 percent (164) of the cutthroat catch (Table 6).

Table 1. Stream temperatures and number of cutthroat spawners captured at the Hunt Creek trap, Priest Lake, Idaho, May 4 - June 7, 1971.

PERIOD COVERED	TEMPERATURE RANGE		NUMBER OF CUTTHROAT CAPTURED
	MEAN MINIMUM	MEAN MAXIMUM	
	(F°)	(F°)	
May 4 - May 10	40	43	1
May 11 - May 16	39	43	0
May 17 - May 22	39	43	0
May 23 - May 28	41	46	2
May 29 - June 3	41	44	0
June 4 - June 7	42	44	0

Table 2. Returns of marked subcatchable cutthroat released in Upper Priest Lake, Idaho, 1970-1971.

YEAR	NUMBER RELEASED	NUMBER MARKED	MARK USED	NUMBER RETURNED TO CREEL (EST.)	
				1970	1971
1970	16,455	16,455	RV	67	3
1971	26,650	26,650	LV	21	
TOTAL	43,105	43,105			



Table 3. Number of anglers interviewed by class, day, and period, Upper Priest Lake, Idaho, 1971.

PERIOD	INCLUSIVE DATES	Anglers Fishing Upper Priest Lake on Census Days									
		Sat.		Sun.		Weekdays				Interview TOTALS	
		1	2	1	2	1	2	3	4		
1	May 1 - May 14	8	**	26	4	1	6	**	**	45	
2	May 15 - May 28	12	**	**	26	3	**	5	**	46	
3	May 29 - June 11	41	**	**	30	25	**	5	**	101	
4	June 12 - June 25	29	25	33	29	7	10	7	*	138	
5	June 26 - July 9	28	56	23	42	4	24	10	20	207	
6	July 10 - July 23	7	42	10	17	21	20	12	9	138	
7	July 24 - Aug. 6	14	8	10	9	7	11	5	10	74	
8	Aug. 7 - Aug. 20	6	5	5	4	8	21	4	7	60	
9	Aug. 21 - Sept. 3	<u>10</u>	<u>5</u>	<u>1</u>	<u>3</u>	<u>*</u>	<u>2</u>	<u>6</u>	<u>13</u>	<u>40</u>	
TOTALS		155	141	108	162	76	94	54	59	849	
Mean (Ave. No. Anglers/Class Day)		19.7		16.9		10.1				14.4	

\* Day missed (missed days were estimated)

\*\* Census day not scheduled

Table 4. Angler catch rates by species, Upper Priest Lake, Idaho, May 1 - September 3, 1971.

PERIOD	INCLUSIVE DATES	NUMBER OF ANGLERS INTERVIEWED	NUMBER OF HOURS FISHED	CUTTHROAT		KOKANEE		DOLLY VARDEN	
				NUMBER	CATCH/HOUR	NUMBER	CATCH/HOUR	NUMBER	CATCH/HOUR
1	May 1 - May 14	45	236	19	.1	0	.0	4	.0
2	May 15 - May 28	46	177	10	.1	5	.0	9	.1
3	May 29 - June 11	101	331	31	.1	9	.0	24	.1
4	June 12 - June 25	138	389	100	.3	71	.2	36	.1
5	June 26 - July 9	207	638	88	.1	223	.3	47	.1
6	July 10 - July 23	138	360	44	.1	27	.1	8	.0
7	July 24 - August 6	74	165	40	.2	17	.1	1	.0
8	Aug. 7 - Aug. 20	60	161	10	.1	13	.1	0	.0
9	Aug. 21 - Sept. 3	<u>40</u>	<u>100</u>	<u>12</u>	<u>.1</u>	<u>34</u>	<u>.3</u>	<u>2</u>	<u>.0</u>
	TOTALS	849	2,557	354		399		131	
	FISH PER HOUR			0.1		0.2		0.1	
	FISH PER ANGLER			0.4		0.5		0.2	

Table 5. Estimated number of anglers, hours fished, and catch, Upper Priest Lake, Idaho, 1971.

PERIOD	INCLUSIVE DATES	EST. NUMBER OF ANGLERS	EST. HOURS FISHED	Estimated Catch		
				CUTTHROAT	KOKANEE	DOLLY VARDEN
1	May 1 - May 14	81	445	41	0	8
2	May 15 - May 28	116	446	25	13	23
3	May 24 - June 11	292	956	89	25	69
4	June 12 - June 25	194	539	156	106	53
5	June 26 - July 9	294	883	116	285	69
6	July 10 - July 23	231	592	80	40	14
7	July 24 - August 6	124	273	74	24	2
8	Aug. 7 - Aug. 20	120	341	22	23	0
9	Aug. 21 - Sept. 3	89	216	26	64	5
TOTALS		1,541	4,691	629	580	243
PERCENT OF CATCH				43	40	17

Table 6. Resident and non-resident sport fishing pressure, effort, and harvest, Upper Priest Lake, Idaho, 1971.

CREEL CENSUS INCLUSIVE DATES	ANGLERS		HOURS FISHED		CUTTHROAT		KOKANEE		DOLLY VARDEN	
	RES.	NON-RES.	RES.	NON-RES.	RES.	NON-RES.	RES.	NON-RES.	RES.	NON-RES.
May 1 - May 14	16	29	86	151	0	19	0	0	0	4
May 15 - May 28	4	42	16	160	3	7	0	5	1	8
May 29 - June 11	14	87	68	263	1	30	2	7	2	22
June 12 - June 25	20	118	64	309	13	87	22	49	2	34
June 26 - July 9	50	157	170	454	28	60	86	137	11	36
July 10 - July 23	45	93	151	207	29	15	13	14	3	5
July 24 - Aug. 6	15	59	29	136	8	32	1	16	0	1
Aug. 7 - Aug. 20	16	44	46	115	3	7	2	11	0	0
Aug. 21 - Sept. 3	14	26	29	71	7	5	15	19	1	1
TOTALS	194	655	659	1,866	92	262	141	258	20	111

## **Nonresident Sport Harvest**

Nonresident sport anglers comprised 78 percent (1,199) of the estimated anglers and harvested 72 percent (1,045) of the estimated catch, and 74 percent (465) of the cutthroat catch (Table 6).

## **Game Fish Harvest**

### **Cutthroat Catch Rates**

During the creel census, project personnel recorded all anglers seeking cutthroat only. In Upper Priest Lake, eight percent (68) of the interviewed anglers sought cutthroat only. They caught 24 percent (84) of the observed cutthroat. Anglers caught the remaining 270 observed cutthroat in conjunction with or incidental to the catch of Dolly Varden and kokanee. The cutthroat catch rate varied from 0.1 to 0.3 fish per hour for the low to high interval (Table 4).

Since 1967, the annual cutthroat catch rate has fluctuated between 0.1 and 0.2 fish per hour (Table 7). Lengths of the census seasons each year may cause some variations, but the annual catch rates have deviated little.

For the past 16 years the catch rates of cutthroat trout at Upper Priest Lake have remained low but consistent. Possibly the cutthroat population at Upper Priest Lake has not been exploited recently because recreational interests of people have changed. Previously unpublished data indicates that 79 percent of the people who visited the lake during the past three years were not anglers (Table 8).

### **Cutthroat Growth**

During the 1971 census season, project personnel measured 62 percent (219) of the 354 observed cutthroat (Table 9). Owing to an over-sight on census procedures the aides did not measure 17 percent (60) of the cutthroat during the first three periods of the census.

Cutthroat measured in the creel ranged in length between 120 and 389 millimeters. Peak frequency occurred between 250 and 259 millimeters. In previous years, 1968 through 1970 peak frequencies ranged between 280 and 289 millimeters (Table 10).

Two alternatives exist as to why the reduction in peak frequency has occurred: (1) A stronger year class of smaller cutthroat dominate the catch, or (2) Overexploitation of older age classes has lead to a noticeably higher percentage of younger age fish in the harvest.

### **Kokanee Catch Rates**

In Upper Priest Lake nearly 16 percent (132) of the interviewed anglers sought kokanee only and caught 31 percent (125) of the observed kokanee. Anglers caught the remaining 274 kokanee while seeking other species. The kokanee catch rate varied from 0.0 to 0.4 fish per hour (Table 4).

Table 7. Estimated number of anglers, hours fished, catch of cutthroat, and catch rates, Upper Priest Lake, Idaho, 1956 and 1966-1971.

YEAR	CREEL CENSUS INCLUSIVE DATES	ESTIMATED NUMBER OF ANGLERS	ESTIMATED HOURS FISHED	CUTTHROAT CATCH	CATCH PER HOUR
1956	April 30 - Oct 15	NA	7,270	1,920	.3
1966	April 30 - Nov 30	NA	5,550	1,262	.2
1967	June 1 - Aug 31	992	2,760	418	.2
1968	June 1 - Sept 6	1,392	4,198	569	.1
1969	June 2 - Oct 5	2,019	5,596	734	.1
1970	May 16 - Oct 2	2,343	6,913	1,112	.2
1971	May 1 - Sept 3	1,541	4,691	629	.1
TOTALS 1967-1971		8,287	24,158	3,462	
AVERAGE 1967-1971					.1

<sup>1</sup>Data from Bjornn (1956) and Leusink (1966) was obtained by creel census procedures different than those used between 1967 and 1971.

Table 8. Observed number of boats traveling down the Thorofare after visiting Upper Priest Lake, Idaho, 1969-1971.<sup>1</sup>

CREEL CENSUS INCLUSIVE DATES	NUMBER OF ANGLER BOATS	NUMBER OF NON-ANGLER BOATS	TOTAL BOATS	PERCENT OF ANGLER BOATS
June 2 - Oct 5, 1969	503	1,599	2,102	24
May 16 - Oct 2, 1970	608	2,273	2,881	21
May 1 - Sept 3, 1971	353	1,504	1,857	19
TOTALS	1,464	5,376	6,840	
AVERAGE				21

<sup>1</sup>All angler boats recorded at check station while non-angler boats were enumerated as they passed the check station.

Table 9. Length frequency distribution of cutthroat caught by sport anglers, Upper Priest Lake, Idaho, 1971.<sup>1</sup>

SIZE CLASS (mm)	Cutthroat Measured By Two-Week Periods									TOTAL
	1*	2*	3*	4	5	6	7	8	9	
120-129						1	1			2
130-139										
140-149						1				1
150-159							3	1		4
160-169										
170-179					2	1	6	1	2	12
180-189										
190-199				2	1	2	2		1	8
200-209				1	3	3	2	2	1	12
210-219				1	2	2				5
220-229				14	12	5	7		2	40
230-239										
240-249				1	2	2			1	6
250-259				14	22	6	4	2	1	49
260-269					4	2				6
270-279				14	8		6	2	1	31
280-289										
290-299					1		1	1		3
300-309				9	2	1	3			15
310-319				2	3	1	1			7
320-329										
330-339				2	3		2		3	10
340-349						1	1			2
350-359				1	2		1			4
360-369										
370-379										
380-389				—	1	1	—	—	—	2
TOTALS				61	68	29	40	9	12	219
MEAN TOTAL LENGTH				264	256	238	240	233	267	

<sup>1</sup>Lengths converted from  $\frac{1}{2}$ -inch increments to MM.

\*No length measurements taken.



Table 10. Mean size (mm) and peak frequency of cutthroat caught by census period, Upper Priest Lake, Idaho, 1968-1971.

PERIOD <sup>1</sup>	1968			1969			1970			1971		
	NO.	MEAN SIZE	RANGE	NO.	MEAN SIZE	RANGE	NO.	MEAN SIZE	RANGE	NO.	MEAN SIZE	RANGE
1												
2							31	281	210-349			
3	32	274	200-349	46	283	210-379	64	273	200-387			
4	36	276	190-359	82	290	190-399	85	296	200-389	61	264	190-359
5	112	275	180-389	91	272	170-419	115	274	180-379	68	256	170-387
6	27	253	190-329	54	258	180-339	17	259	200-309	29	238	120-389
7	7	246	200-339	24	271	170-379	30	298	190-399	40	240	120-359
8	9	258	200-329	8	267	230-339	3	284	220-319	9	233	150-299
9	24	262	190-359	58	259	190-359	20	251	190-359	12	267	170-339
10				14	262	200-349	24	261	200-309			
11				25	268	210-399	38	295	210-419			

<sup>1</sup>Periods are based on two-week intervals which overlap by two or three days.

Prior to 1971, the annual kokanee catch rate fluctuated between 0.3 and 0.6 fish per hour and averaged 0.4 (Table 11). However, the 1971 catch rate declined sharply to 0.1 fish per hour.

### **Dolly Varden Catch Rates**

A negligible percentage of anglers fishing Upper Priest Lake sought Dolly Varden in 1971. Primary pressure exerted on Dolly Varden came from those anglers seeking both Dolly Varden and cutthroat. They caught 66 percent (87) of the 131 Dolly Varden harvested. The 1971 Dolly Varden catch varied little from 0.0 to 0.1 fish per hour (Table 4).

Since 1967, the annual Dolly Varden catch rate has remained near 0.03 fish per hour (Table 12).

### **Tributary Streams Survey Catch Rates**

In 1971, during June all streams were swollen with heavy spring runoff. By mid-July flows had receded allowing increased access to stream areas and better fishing. The month of August afforded the best tributary fishing, especially for cutthroat.

In general, we conducted our angling effort on the middle and upper reaches of a stream. We found fishing quite poor on the lower ends of streams. We collected interview data from anglers fishing Granite, Reeder, and Soldier creeks and added these to our data. I noticed only one angler fishing Two-Mouth Creek in July. No angler fished Hunt, Indian, Lion, or Kalispell creeks on survey days.

Cutthroat trout were dominant in nearly all the tributaries (Table 13). Brook trout catches in Lamb, Reeder, and Reynolds creeks exceeded the cutthroat catch. In Granite Creek many hatchery released rainbow were caught.

We examined all captured cutthroat (520) for fin clips. None were found. Apparently none of our planted fish migrated to the streams.

Catch rates for the tributaries ranged between 0.4 and 7.8 fish per hour (all species included) with an average rate of 1.8 fish per hour. We caught the highest number of cutthroat (118) from Two-Mouth Creek, 40 brook trout in Reeder Creek, and 88 hatchery rainbow in Granite Creek.

In 1971, we fished all major streams fished by Ted Bjornn (1956) except Blacktail and South Fork Granite creeks (Table 14). I recorded lower catch rates for all streams fished in 1971 but this could be due to varying skill.

### **Cutthroat Age and Growth**

During the stream survey project personnel measured 67 percent (346) of 520 captured cutthroat (Table 15).

Table 11. Estimated number of anglers, hours fished, catch of Kokanee and catch rates, Upper Priest Lake, Idaho, 1967-1971.<sup>1</sup>

YEAR	CREEL CENSUS INCLUSIVE DATES	ESTIMATED NUMBER OF ANGLERS	ESTIMATED HOURS FISHED	KOKANEE CATCH	CATCH PER HOUR
1956	April 30 - Oct 15	NA	7,270	1,620	.2
1966	April 30 - Nov 30	NA	5,550	3,019	.5
1967	June 1 - Aug 31	992	2,760	757	.3
1968	June 1 - Sept 6	1,392	4,198	2,366	.6
1969	June 2 - Oct 5	2,019	5,596	3,246	.6
1970	May 16 - Oct 2	2,343	6,913	2,015	.3
1971	May 1 - Sept 3	<u>1,541</u>	<u>4,691</u>	580	.1
TOTALS 1967-1971		8,287	24,158	8,964	
AVERAGE 1967-1971					.4

<sup>1</sup>Data from Bjornn (1956) and Leusink (1966) was obtained by creel census procedures different than those used between 1967 and 1971.

Table 12. Estimated number of anglers, hours fished, catch of Dolly Varden, and catch rates, Upper Priest Lake, Idaho, 1967-1971.<sup>1</sup>

YEAR	CREEL CENSUS INCLUSIVE DATES	ESTIMATED NUMBER OF ANGLERS	ESTIMATED HOURS FISHED	DOLLY VARDEN CATCH	CATCH PER HOUR
1956	April 30 - Oct 15	NA	7,270	240	.03
1966	April 30 - Nov 30	NA	5,550	597	.10
1967	June 1 - Aug 31	992	2,760	93	.03
1968	June 1 - Sept .6	1,392	4,198	146	.03
1969	June 2 - Oct 5	2,019	5,596	158	.03
1970	May 16 - Oct 2	2,343	6,913	307	.04
1971	May 1 - Sept 3	1,541	4,691	131	.03
TOTALS 1967-1971		8,287	24,158	835	
AVERAGE 1967-1971					.03

<sup>1</sup>Data from Bjornn (1956) and Leusink (1966) was obtained by creel census procedures different than those used between 1967 and 1971.

Table 13. Number of fish caught and observed in 15 tributary streams of Priest and Upper Priest Lakes, Idaho, 1971.

STREAMS	DATES FISHED	HOURS FISHED	Number Of Fish Caught				TOTAL	FISH /HOUR	Additional Number Of Fish Observed		
			CUT- THROAT	DOLLY VARDEN	EASTERN BROOK	RAINBOW			CUT- THROAT	DOLLY VARDEN	EASTERN BROOK
Caribou Creek	6-14 7-20	22	11				11	0.5	4		2
Gold Creek	8-16	12	22				22	1.8		1	
Granite Creek	6-7,21,29 7-1,9	50	14		1	88	103	2.1			
Hughes Fork	6-30 8-17	21	14				14	0.7	6	1	
Hunt Creek	6-15, 24 8-6,26	26	43				43	1.7	1		
Indian Creek	7-13,26 8-6,23	36	40				40	1.1	15	4	1
Kalispell Creek	7-6,7	26	10		3		13	0.5			
Lamb Creek	8-11,27	17			11		11	0.7			5
Lion Creek	7-15,28 8-24	21	102				102	4.9	2		
Reeder Creek	6-6,17 7-6 8-10	19	9		40		49	2.6			
Reynolds Creek	6-5	4			12		12	3.0			
Soldier Creek	6-30 7-19	34	42	3	7	8	60	1.8			
Two-Mouth Creek	7-14,27 8-26	30	118				118	3.9			
Trapper Creek	8-4,12	10	78				78	7.8		2	1
Upper Priest	6-29 7-21 8-18	50	17	4			21	0.4	16	24	
TOTAL		378	520	7	74	96	697	1.8	44	32	9

Table 14. Catch rates of all species by tributary stream, Priest and Upper Priest lakes, Idaho, 1956 and 1971.

STREAMS	1956			1971		
	HOURS FISHED	FISH CAUGHT	FISH 1 HOUR	HOURS FISHED	FISH CAUGHT	FISH 1 HOUR
Blacktail Creek	3	16	5.3			
Caribou Creek				22	11	0.5
Gold Creek	6	38	6.3	12	22	1.8
Granite Creek				50	103	2.1
Hughes Fork	14	51	3.6	21	14	0.7
Hunt Creek	2	6	3.0	26	43	1.7
Indian Creek	6	22	3.7	36	40	1.1
Kallispell Creek	6	45	7.5	26	13	0.5
Lamb Creek				17	11	0.7
Lion Creek				21	102	4.9
Reeder Creek				19	49	2.6
Reynolds Creek				4	12	3.0
Soldier Creek	5	27	5.4	34	60	1.8
S.F. Granite Creek	4	24	6.0			
Two-Mouth Creek	16	67	4.2	30	118	3.9
Trapper Creek	5	54	10.8	10	78	7.8
Upper Priest				50	21	0.4

Table 15. Length frequency distribution of cutthroat caught in 15 tributary streams, Priest and Upper Priest Lakes, Idaho, 1971.

STREAMS	NUMBER OF CUTTHROAT MEASURED IN $\frac{1}{2}$ -INCH INCREMENTS																												TOTAL	
	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10	10.5	11	11.5	12	12.5	13	13.5	14	14.5	15	15.5	16		16.5
Caribou Creek					2	1		3	2	2																		1	11	
Gold Creek					2	4	2	3	3	2	3					2	1												22	
Granite Creek						1															1								2	
Hughes Fork		1		2	1	2	3	1	2	1						1													14	
Hunt Creek				1				2	1		1																		5	
Indian Creek		1				12	5	4	8	3	2																		35	
Kalispell Creek				1		2	1		1			1																	6	
Lamb Creek	No Cutthroat Caught																													
Lion Creek				3		4	34	25	12	14	6		2	2															102	
Reeder Creek	1	1		2	2	1	1	1																					9	
Reynolds Creek	No Cutthroat Caught																													
Solider Creek				1	2	6	4	12	5	7	3	2	1																43	
Two-Mouth Creek		1	2	1	2	2	2	1	4	3	1	2	1																22	
Trapper Creek		1		5	11	7	6	5	1	5	7	5	1		4														58	
Upper Priest River									3	1						1			1	1	1	3	1	1	1		2	1	17	
TOTAL	1	5	2	16	22	42	58	57	39	37	23	13	6	2	4	4	1		1	1	2	3	1	1	1		2	1	1	346

Cutthroat from all tributaries ranged between 2.5 and 16.5 inches in length (Table 16). Average length of 346 measured cutthroat was 5.5 inches. We caught nine of the 10 cutthroat over 13 inches in length from Upper Priest River.

I aged 175 cutthroat from all tributaries. Eighty-nine percent of these fish were in their third and fourth summers of life at capture (Table 17). They ranged in size between three and 10 inches. Fifteen cutthroat over 10 inches were in their fifth or sixth summer.

We caught 17 mature cutthroat, all males, under 10 inches in Hunt, Indian, Lion, and Two-Mouth creeks. Apparently spawning by stream resident cutthroat is prevalent in the east side tributaries to Priest Lake.

### **Cutthroat Spawning Tributaries**

I made general observations to measure the suitability and use of cutthroat spawning tributaries by Dolly Varden and lake cutthroat. I compared the results to those attained by Ted Bjornn in 1956 and in one instance by Leusink in 1967.

#### **Caribou Creek**

1956: Caribou Creek at the present time appears to contribute very little to the lake fisheries.

1971: Very poor habitat quality (heavily sanded and poor spawning rubble) on the lower end. One lake cutthroat spawner caught. Majority of smaller cutthroat caught near Bugle and Abandon creeks in boulder-strewn areas. Presence of spawner indicates use but contribution probably still minimal.

#### **Gold Creek**

1956: Because of the limited amount of spawning area, the number of fish contributed to the lake fishery by this stream is considered to be relatively small.

1971: No change to the contrary evident. Observed Dolly Varden juvenile indicates stream still accessible to migrant spawners.

#### **Granite Creek**

1956: Granite Creek and its tributaries probably contribute a larger number of cutthroat to the lake fishery (Priest Lake) than any other creek.

1971: No large migrant spawners observed between Blacktail Creek Road and Athol Creek. Only very limited observations and sampling on lower three miles because of access and high water difficulties. Spawning gravel appears suitable in this lower section but no large cutthroat observed or caught. Rainbow-cutthroat hybridization prominent in stream (observed, but unrecorded data). Contribution to lake fishery cannot be confirmed or denied.



Table 16. Size range and mean size of fish species caught in 15 tributary streams, Priest and Upper Priest Lakes, Idaho, 1971.

STREAMS	CUTTHROAT			DOLLY VARDEN				EASTERN BROOK			
	SIZE RANGE		NUMBER MEASURED	SIZE RANGE		MEAN SIZE	NUMBER MEASURED	SIZE RANGE		MEAN SIZE	NUMBER MEASURED
	MIN -	MAX		MIN -	MAX			MIN -	MAX		
Caribou Creek	4.5 -	16.5	11								
Gold Creek	4.5 -	10.5	22								
Granite Creek	5.0 -	12.5	2								
Hughes Fork	3.0 -	10.0	14								
Hunt Creek	4.0 -	6.25	5								
Indian Creek	3.0 -	7.5	35			4.0	1				
Kalispell Creek	4.0 -	8.0	6								
Lamb Creek								4.5 -	8.0	7.0	11
Lion Creek	4.0 -	9.0	102								
Reeder Creek	2.5 -	5.5.	9					3.5 -	12.5	6.7	18
Reynolds Creek											
Soldier Creek	4.0 -	9.0	43	4.0 -	6.0	5.3	3				
Two-Mouth Creek	3.0 -	8.5	22								
Trapper Creek	3.0 -	9.5	58	4.0 -	4.5	4.3	2				
Upper Priest	8.0 -	16.0	17	13.5 -	30.5	22.0	4				
	2.5 -	16.5	346	4.0 -	30.5	11.7	10	3.5 -	12.5	6.8	29

Table 17. Age and length frequencies for cutthroat caught in tributaries to Priest and Upper Priest Lakes, 1971.

SIZE IN INCHES	AGE CLASS (Number of Annuli)					TOTAL
	1 (2nd Summer)	2 (3rd Summer)	3 (4th Summer)	4 (5th Summer)	5 (6th Summer)	
2.5	1					1
3	2	1				3
3.5	1					1
4		6				6
4.5		9				9
5		15				15
5.5		18				18
6		26	7			33
6.5		9	15			24
7		10	13			23
7.5		1	10			11
8		1	7			8
8.5			4			4
9			1			1
9.5			2			2
10			1	3		4
10.5						
11						
11.5				1		1
12				1		1
12.5				1		1
13				3		3
13.5				1		1
14					1	1
14.5					1	1
15						
15.5				1	1	2
16					1	1
<hr/>						
TOTAL	4	96	60	11	4	175
PERCENT	2.3	54.8	34.3	6.3	2.3	100.0

### **Hughes Fork**

1956: Hughes Fork contributes the majority of the fish to the upper lake fishery.

1971: Numerous log jams. Suitable spawning habitat below Hughes meadow available but no cutthroat spawners observed or caught. This stream may still contribute to the lake fishery but sampling was not intensive enough in June to detect any cutthroat spawners using the tributary. No fry were observed in August.

### **Hunt Creek**

1956: Hunt Creek with an impassible falls one half mile from the mouth is of little importance for lake cutthroat spawning.

1971: Returns to the trap have ranged between 3 and 21 mature cutthroat spawners since 1968. Above falls numerous resident cutthroat present. Contribution to the lake fishery probably present but in very small numbers.

### **Indian Creek**

1956: Small cutthroat were quite abundant with some being obviously mature resident fish while others appeared to be fish that might enter the lake.

1971: Few fish found on lower end. One four-inch Dolly Varden caught indicates migrant species do use stream for spawning, but the contribution to Priest Lake from lake cutthroat spawners may be very small. Most fish caught in boulder-strewn areas and probably resident cutthroat.

### **Kalispell Creek**

1956: Sand and silt have covered most of the spawning beds above the main road (approximately four miles upstream from the mouth) leaving a three-mile stretch immediately up from the mouth as the only portion of the stream capable of supporting a spawning run. Large numbers of small (up to nine inches and all immature) cutthroat were found in this three-mile stretch up from the mouth.

1967: Leusink (1968) reported: "During early June, two days were spent fishing Kalispell Creek for cutthroat trout in an attempt to locate the region of the stream used for spawning. No spawners were located above Highway 57 which crosses Kalispell Creek approximately three miles above the lake. Five spawners were caught between Highway 57 and the lake. Proportion expansion estimates indicates that there were 79 spawners using Kalispell Creek in 1967 and that 15 of these were spawning for the second consecutive year." (Apparently most of the significant spawning occurred between Highway 57 and the lake.)

1971: According to U. S. Forest Service stream transects (1966 and 1971) the greatest percentage of bottom type in the lower three miles of

Kalispell Creek is silt-sand. Observations indicate that the habitat has remained the same since 1966, but we caught no cutthroat spawners below Highway 57 during the survey. Forest Service personnel reported catching a few adult spawners. One U. S. Forest Service employee reported that during 12 trips to Kalispell in 1971 nearly 90 percent of his take was brook trout. Project personnel caught only 10 cutthroat (eight inches or less) in the lower three miles. Apparently interspecies competition between brook trout and cutthroat trout has lowered the cutthroat contribution to the lake fishery.

#### **Lamb, Reeder, and Reynolds Creeks**

Brook trout streams of little importance for cutthroat spawning except extreme lower end of Reeder Creek where nine cutthroat (2.5 to 6.0 inches) caught may possibly indicate a minimal contribution to the lake fishery.

#### **Lion Creek**

1956: It is believed that Lion Creek presently contributes very little to the Priest Lake cutthroat fishery.

1971: Lower end below highway, heavily degraded by silt-sand. Log jams and dead falls very numerous on lower end with spawning habitat very unsuitable. Large numbers of small cutthroat (probably resident) were caught in boulder-strewn areas. What little contribution to the lake fishery has been made in the past has been further reduced.

#### **Soldier Creek**

1956: This creek probably contributes little to the lake cutthroat fishery.

1971: Ample number of small cutthroat in upper reaches of stream. Large numbers of Dolly Varden present in the upper reaches in 1956, not found in 1971. Stairway falls created by numerous log jams may have impeded Dolly Varden migrations. Hatchery rainbow, brook trout, and Dolly Varden caught on lower end. No contribution to lake cutthroat fishery evident.

#### **Two-Mouth Creek**

1956: This stream contributes some fish to the Priest Lake cutthroat fishery, but the number is small.

1971: Like Lion Creek, the habitat on lower reaches has been de-graded. Numerous log jams present throughout stream. No cutthroat found above falls about five miles from the mouth. Largest number of cutthroat caught near the falls. No Dolly Varden or brook trout caught. Spawning habitat limited but could support lake cutthroat. Contribution possible to the lake fishery but could not be definitely substantiated since no adults of migrant species were caught or observed.

### **Trapper Creek**

1956: The number of fish contributed to the lake fishery is unknown and probably depends to a large extent upon the number of fish that are able to get past the rapids and falls to the comparatively good spawning beds in the meadow above the gorge.

1971: Lowest one half mile of stream badly degraded (heavy sand deposits). Large numbers of small cutthroat throughout first one and one-half miles of stream. Spawning bed gravels highly compacted in areas. Two Dolly Varden juveniles indicate accessibility of stream to migrant species. Contribution to the lake cutthroat fishery is possible.

### **Upper Priest River**

1956: Upper Priest River contains spawning area in sizable amounts; however, the number of spawning fish using the river appears to be relatively small.

1971: Huge log jams and massive gravel dunes (in some areas highly compacted) characterize this stream. This is the only stream where lake cutthroat and Dolly Varden spawners were caught and observed. We caught cutthroat 8 to 10 inches about one mile below Upper Priest Falls in the boulder-strewn areas. Fingerlings found in smaller tributaries (Rock and Lime creeks).

### **DISCUSSION:**

Probably the reason that we caught few fish on the lower ends of these creeks was because degraded habitat precluded the presence of fish. In many instances, heavy deposits of sand have destroyed the spawning gravels, filled in pools, and altered the food-producing potential of these streams.

At times, I found apparently suitable spawning rubble, but a closer inspection showed heavy sand deposits between the rocks. Not only is this highly unsuitable for spawning but results in poor survival of eggs and fry. Also, few aquatic insects can survive to provide food in this type of environment.

It appears that we now have fewer cutthroat spawners, higher egg mortality, fewer pools, and less food for juvenile cutthroat which could be hampering contribution to the lake cutthroat fishery. Yet both lakes maintain this fishery because of the light angler pressure.

The primary contributors of sediments to streams in the Priest Lake area are: (1) The erosion from roads, bridges, and logging skid trails and (2) Erosion after sizable forest fires such as the Trapper Peak and Sundance Fires of 1967.

I can see little value in building stream improvement structures and clearing out log jams to improve lake cutthroat spawning habitat when the streams contain sediment from improper land management. Rather, I feel

that the best stream improvement procedures is proper land use.

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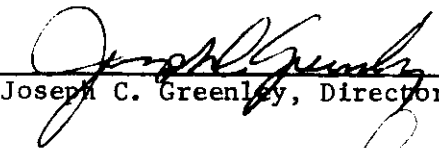
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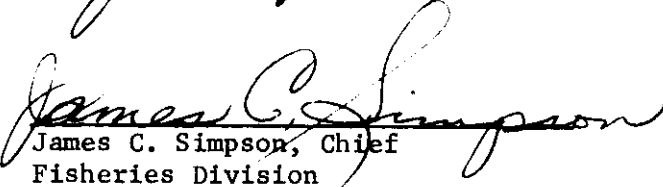
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